

AEROSPACE MATERIAL SPECIFICATION

AMS 3072E

Issued MAR 1942
Revised JUL 1977
Noncurrent OCT 1984
Cancelled APR 2007

Superseding AMS 3072D

Compound, Corrosion Preventive
Aircraft Engine

RATIONALE

This specification has been noncurrent since 1985 and was determined to be no longer necessary after completion of a Five Year Review.

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AEROSPACE MATERIAL SPECIFICATION



AMS 3072D

Issued MAR 1942
Revised JUL 1977
Noncurrent OCT 1984

Superseding AMS 3072C

Compound, Corrosion Preventive Aircraft Engine

NONCURRENT NOTICE

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1. SCOPE:**1.1 Form:**

This specification covers a blend of corrosion-preventive compound concentrate and petroleum-base aircraft-engine lubricating oil in the form of a ready-to-use liquid.

1.2 Application:

Primarily for use in preservation of metal parts of aircraft engines during shipment and/or storage and for lubrication of the engine while operating during preservations.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications:

Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350	Standards and Test Methods
AMS 3071	Concentrate, Corrosion Preventive Compound, Aircraft Engine
AMS 3160	Solvent, Petroleum
AMS 3420	Dehydrating Agent, Silica Gel
AMS 5042	Carbon Steel and Sheet and Strip, Forming Grade

2.2 ASTM Publications:

Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19120.

ASTM D88	Saybolt Viscosity
ASTM D91	Precipitation Number of Lubricating Oils
ASTM D92	Flash and Fire Points by Cleveland Open Cup
ASTM D97	Pour Point of Petroleum Oils
ASTM D130	Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test
ASTM D189	Conradson Carbon Residue of Petroleum Products
ASTM D445	Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
ASTM D482	Ash from Petroleum Products
ASTM D2270	Calculating Viscosity Index from Kinematic Viscosity at 40°C and 100°C

2.3 Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Specifications:

MIL-L-6082 Lubricating Oil; Aircraft Reciprocating Engine (Piston)

2.3.2 Military Standards:

MIL-STD-290 Packaging, Packing and Marking of Petroleum Products

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be a blend of one volume of AMS 3071 concentrate and three volumes of MIL-L-6082, Grade 1100 aircraft engine lubricating oil.

3.1.1 Toxicity: Compound shall contain no materials of known toxicity. The vapor shall not cause discomfort or injury to workmen engaged in application of the compound.

3.2 Properties:

Compound shall conform to the following requirements; tests shall be conducted in accordance with the specified test methods:

3.2.1	Viscosity, Saybolt Universal at 210°F (99°C)	90 - 110 sec	ASTM D88 or D445
3.2.2	Viscosity Index, min	95	ASTM D2270
3.2.3	Flash Point, min	400°F (204°C)	ASTM D92
3.2.4	Pour Point, max	10°F (-12°C)	ASTM D97
3.2.5	Carbon Residue, max	2.0%	ASTM D189
3.2.6	Precipitation Number, max	0.1	ASTM D91
3.2.7	Ash (20 g sample) max	0.015%	ASTM D482
3.2.8	Volatile Matter by weight, max	3.0%	4.5.1
3.2.9	Corrosion, Copper Strip	No pitting; no discoloration greater than 2a	4.5.2

AMS 3072D	SAE	AMS 3072D
3.2.10 Humidity Protection, min	336 hr	4.5.3
3.2.11 Hydrobromic Acid Neutralization, min	24 hr	4.5.4
3.2.12 Stability: Compound shall show no separation of insoluble material after being subjected to the tests of 4.5.5.		
3.2.13 Application and Removability: Compound shall form a continuous, completely protective film on metals by any method of application and shall be readily removed by spraying with AMS 3160 petroleum solvent or by wiping with cloths saturated with the solvent.		
3.2.14 Effect on Color-Indicating Properties of Cobalt-Chloride-Impregnated Silica Gel: Compound shall show no adverse effect on the property of cobalt-chloride-impregnated silica gel to indicate the degree of saturation and equivalent relative humidity, determined in accordance with 4.5.6.		
4. QUALITY ASSURANCE PROVISIONS:		
4.1 Responsibility for Inspection:		
The vendor of compound shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.6. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the compound conforms to the requirements of this specification.		
4.2 Classification of Tests:		
4.2.1 Acceptance Tests: Tests to determine conformance to viscosity (3.2.1), viscosity index (3.2.2), volatile matter (3.2.8), copper-strip corrosion (3.2.9), humidity protection (3.2.10), hydrobromic acid neutralization (3.2.11), and application and removability (3.2.13) requirements are classified as acceptance tests.		
4.2.2 Periodic Tests: Tests to determine conformance to flash point (3.2.3), pour point (3.2.4), carbon residue (3.2.5), precipitation number (3.2.6), ash (3.2.7), stability (at high and low temperature only) (3.2.12), and effect on color-indicating properties of cobalt-chloride-impregnated silica gel (3.2.14) requirements are classified as periodic tests.		
4.2.3 Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classified as qualification tests.		
4.2.3.1 For direct U.S. Military procurement, substantiating test data and, when requested, qualification test material shall be submitted to the cognizant qualification agency as directed by the procuring activity, the contracting officer, or the request for procurement.		

4.3 Sampling:

Sufficient compound shall be selected from each lot to permit performing the required acceptance tests. Frequency of sampling for periodic tests and the size of samples for periodic tests and qualification tests shall be as agreed upon by purchaser and vendor.

- 4.3.1 A lot shall be all compound produced in a single production run from the same batches of concentrate and oil under the same fixed conditions and submitted for vendor's inspection at one time.

4.4 Approval:

- 4.4.1 Sample compound shall be approved by purchaser before compound for production use is supplied, unless such approval be waived. Conditional approval may be granted before completion of the long-time storage stability test provided the compound meets the other technical requirements of this specification. Results of tests on production compound shall be essentially equivalent to those on the approved sample.
- 4.4.2 Vendor shall use concentrate and lubricating oil, manufacturing procedures, processes, and methods of inspection on production compound which are essentially the same as those used on the approved sample compound. If any change is necessary in concentrate or lubricating oil, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material and processing and, when requested, sample compound. Production compound made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

- 4.5.1 Volatile Matter: Approximately 10 g of compound shall be weighed, to the nearest 0.1 g, into a tared dish measuring about 2-3/4 in. or 70 mm in diameter by about 3/4 in. or 20 mm deep. The dish shall be placed in an oven maintained at $221^{\circ}\text{F} \pm 2$ ($105^{\circ}\text{C} \pm 1$) for 24 hours ± 0.25 . After heating, the dish shall be reweighed and the volatile matter calculated.
- 4.5.2 Copper Strip Corrosion: Shall be determined in accordance with ASTM D130 except that the test temperature shall be $212^{\circ}\text{F} \pm 2$ ($100^{\circ}\text{C} \pm 1$) instead of 122°F (50°C).

- 4.5.3 Humidity Protection: Two 2 x 4 in. or 50 x 100 mm freshly sand blasted and cleaned panels of low-carbon steel, AMS 5042 or equivalent, shall be dipped in the compound so as to submerge completely all surfaces and shall then be suspended vertically in an atmosphere maintained at $77^{\circ}\text{F} \pm 5$ ($25^{\circ}\text{C} \pm 3$) and 50 - 55% relative humidity for not less than 4 hours. At the end of this period, the panels shall be suspended vertically in a humidity cabinet operating at a temperature of $120^{\circ}\text{F} \pm 2$ ($49^{\circ}\text{C} \pm 1$) and a relative humidity of 97 - 100%. Clean, humidified air shall flow over the panels at a rate of 8 linear ft ± 1 per hour ($677 \mu\text{m} \pm 85/\text{sec.}$) Upon completion of the specified time, the panels shall be removed from the cabinet, cleaned with naphtha, and examined. Visible corrosion of any surface, except within 1/8 in. (3.2 mm) from any edge, shall be cause for rejection of the compound. If no more than three rust spots no larger than 1 mm in diameter occur, the compound shall be retested. If, on retesting, no rust spots occur, the compound shall be considered acceptable.
- 4.5.4 Hydrobromic Acid Neutralization: Two 2 x 4 in. or 50 x 100 mm freshly sand blasted and cleaned panels of low-carbon steel, AMS 5042 or equivalent, shall be dipped in a 10% emulsion of 0.2% hydrobromic acid solution in aircraft engine lubricating oil and slushed vigorously for not less than 1 minute. The panels shall be removed and allowed to drain for not less than 1 minute. Each panel shall then be dipped in the corrosion-preventive compound ten times per minute for 11 mm. ± 0.1 in such a manner that the panel is immersed completely each time. The panels shall then be suspended vertically in an atmosphere maintained at $77^{\circ}\text{F} \pm 5$ ($25^{\circ}\text{C} \pm 3$) and 50 - 55% relative humidity for not less than 4 hours. After draining, the panels shall be hung vertically in the humidity cabinet specified in 4.5.3 for not less than 24 hours. At the end of the period, the panels shall be cleaned with naphtha and examined for corrosion. Visible corrosion on any surface, except within 1/8 in. (3.2 mm) from any edge shall be unacceptable.
- 4.5.5 Stability:
- 4.5.5.1 At High and Low Temperatures: Approximately 25 cm^3 of compound shall be poured into a heat-resistant glass test tube approximately 6 in. (150 mm) long x 3/4 in. (19 mm) diameter. The test tube shall be placed in an oven maintained at $205^{\circ}\text{F} \pm 5$ ($96^{\circ}\text{C} \pm 3$) for 24 hr, allowed to cool to room temperature in still air, and further cooled by placing the tube in a cold box maintained at $0^{\circ}\text{F} \pm 5$ ($-18^{\circ}\text{C} \pm 3$) for 16 hours. The sample shall be allowed to return to room temperature, allowed to stand at room temperature for 10 days, and examined by transmitted light for evidence of separation of insoluble material.
- 4.5.5.2 Long-Time Storage: A 1-gal (3.8-dm^3) sample shall be stored for 12 months in the dark in a clean, wide-mouth, glass container approximately 10 in. deep x 5-1/2 in. diameter with a 2-1/2 in. opening (250 mm deep x 140 mm diameter with a 65 mm opening). After the storage period, the contents shall be examined for evidence of separation and shall be subjected to the humidity protection test of 4.5.3.